



# Uncomplicating Diabetes: Reducing the Burden of Diabetes- Related End-Organ Injury

February 25–March 1, 2018 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

## Scientific Organizers:

**Mark E. Cooper**, Monash University, Melbourne

**Thomas M. Coffman**, NUS Duke Singapore, Singapore

**Matthias G. von Herrath**, Novo Nordisk/La Jolla Institute for Allergy and Immunology, USA

**Susan Quaggin**, Northwestern University, USA

*Joint with the meeting on **Vascular Biology and Human Diseases: From Molecular Pathways to Novel Therapeutics***

*This Keystone Symposia conference will address diabetic complications which remain the major cause of morbidity and mortality in the diabetic population. Although the outlook has improved over the last two decades with respect to diabetic vascular disease, these complications remain a major burden with the underlying explanation for these complications at a molecular and cellular level as yet not fully clarified. With recent advances in the management of diabetes, particularly new classes of glucose-lowering agents, it is critical to determine if these new therapies have both glucose-dependent and independent effects in reducing diabetes-related end-organ injury. With major advances in our understanding of key pathological features of diabetic complications such as angiogenesis, fibrosis, inflammation and vascular remodeling, albeit in non-diabetic contexts, now is the time to translate this new knowledge to the field of diabetic complications. By learning from and recruiting such researchers into the field of diabetic complications, there is a great opportunity to develop novel, highly innovative approaches to identify new targets in order to discover new ways to treat, reverse or prevent diabetic complications that lead to premature atherosclerosis, heart failure, blindness, cognitive impairment and end-stage renal disease.*

## Session Topics:

- New Treatments in Diabetes
- Lipids and Diabetic Complications
- Endothelial Metabolism and Neurovascular Crosstalk (Joint)
- Mitochondria and Diabetic Complications
- Genomics and Epigenomics in Diabetic Complications
- Oxidative Stress and Diabetic Complications
- Inflammation, the Vasculature and Diabetic Complications (Joint)
- Vasoactive Hormones in Diabetic Complications

**Scholarship Application & Discounted Abstract Deadline: November 13, 2017**

**Abstract Deadline: November 28, 2017**

**Discounted Registration Deadline: December 20, 2017**



Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted. Submitting an abstract is an excellent opportunity to gain exposure for your work. Abstracts submitted by the abstract deadline will also be considered for short talks on the program.

Meeting Hashtag: #KSdiabetes  
[www.keystonesymposia.org/18J7](http://www.keystonesymposia.org/18J7)

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# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Uncomplicating Diabetes: Reducing the Burden of Diabetes-Related End-Organ Injury (J7)

Scientific Organizers: Mark E. Cooper, Thomas M. Coffman, Matthias G. von Herrath and Susan Quaggin

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## Vascular Biology and Human Diseases: From Molecular Pathways to Novel Therapeutics (J8)

Scientific Organizers: Elisabetta Dejana, Anne C. Eichmann and Gavin O. Thurston

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### SUNDAY, FEBRUARY 25

#### Arrival and Registration

### MONDAY, FEBRUARY 26

#### Welcome and Keynote Address (J7)

\***Daniel J. Drucker**, Lunenfeld-Tanenbaum Research Institute, Canada

**Steven E. Kahn**, University of Washington, USA  
*Current Management of Type 2 Diabetes*

#### Welcome and Keynote Address (J8)

\***Elisabetta Dejana**, Uppsala University, Sweden

**Kari K. Alitalo**, University of Helsinki, Finland  
*Therapeutic Potential of Vascular Growth Factors*

#### New Treatments in Diabetes (J7)

\***Mark I. McCarthy**, University of Oxford, UK

**Daniel J. Drucker**, Lunenfeld-Tanenbaum Research Institute, Canada  
*GLP-1-Mediated Reduction in Complications of Diabetes*

**Volker Vallon**, University of California, San Diego, USA  
*SGLT2 Inhibition – Insights from Experimental Studies*

**David Cherney**, University of Toronto, Canada  
*SGLT2 Inhibition: Renal Effects in Man*

\***Simeon Taylor**, University of Maryland School of Medicine, USA  
*Short Talk: Canagliflozin Triggers the FGF23/1,25-dihydroxyvitamin/PTH Axis: A Potential Mechanism Mediating Adverse Effects on Bone Health*

**Anita C. Aperia**, Karolinska Institute, Sweden  
*Short Talk: Vulnerability of SGLT-Expressing Cells to Hyperglycaemia*

#### Vascular Growth Factors: Biological Relevance and Therapeutic Application (J8)

\***Anne C. Eichmann**, Yale University School of Medicine, USA

**Michael Simons**, Yale University, USA  
*Cell Type Specificity of FGF/TGF Signaling*

**Lena Claesson-Welsh**, Uppsala University, Sweden  
*Vascular Leakage in Cancer and Retinopathy*

**Shahin Rafii**, Weill Cornell Medical College, USA  
*Ultradian Vascular Niche Signals in Organotypic Stem Cell Regeneration*

**Anna I. Dimberg**, Uppsala University Hospital, Sweden  
*Short Talk: CD93 in Regulation of Tumor Angiogenesis*

**Roxana Ola**, Yale University, USA  
*Short Talk: Smad4 Acts Downstream of BMP9/10-ALK1 in Mediating AVM Formation through Transcriptional Modulation of CK2/PDEN/PI3K Signaling Cascade*

#### Lipids and Diabetic Complications (J7)

\***Moshe Levi**, Georgetown University, USA

\***Josephine Forbes**, University of Queensland, Australia

**Katalin Susztak**, University of Pennsylvania, USA  
*How to Turn GWAS Signals into Drugs for Kidney Disease?*

**Weier Qi**, Joslin Diabetes Center, Harvard Medical School, Boston, USA  
*Human Proteomics to Therapeutics for Diabetic Nephropathy - The 50-Year Joslin Medalist Study*

**Eoin P. Brennan**, Conway Institute, Ireland  
*Short Talk: Targeting Inflammation in Diabetic Kidney Disease Using Pro-Resolving Lipid Mediators*

#### Vascular Growth Factors: Receptors and Biological Role (J8)

\***Lena Claesson-Welsh**, Uppsala University, Sweden

**Gou Young Koh**, Institute of Basic Science, South Korea  
*Tie2-Activating Antibody "ABTAA" for Micro-vascular Diseases*

**Gavin O. Thurston**, Regeneron Pharmaceuticals Inc., USA  
*Tumor Endothelial Cell Heterogeneity and Responses to Anti-Vascular Therapy*

**Luisa Iruela-Arispe**, University of California, Los Angeles, USA  
*Critical Signaling Nodes in Vascular Homeostasis*

**Hong Chen**, Harvard Medical School, USA  
*Short Talk: Epsin's Role in Diabetic Lymphangiogenesis*

#### Poster Session 1

### TUESDAY, FEBRUARY 27

#### Endothelial Metabolism and Neurovascular Cross-Talk (Joint)

\***George L. King**, Joslin Diabetes Center, USA

\***Luisa Iruela-Arispe**, University of California, Los Angeles, USA

**Peter F. Carmeliet**, University of Leuven, VIB, Belgium  
*Endothelial Cell Metabolism and Therapeutic Interventions*

**Susan Quaggin**, Northwestern University, USA  
*VE-PTP Phosphatase Inhibition Protects the Kidney in Diabetes*

**Anne C. Eichmann**, Yale University School of Medicine, USA  
*Neurovascular Cross-Talk and Possible Pathological Implications*

**David L. Silver**, Duke-NUS Medical School, Singapore  
*Brain Lipid Transport*

**Kevin G. Peters**, Aerpio Pharmaceuticals, USA  
*Short Talk: Targeting VE-PTP for Tie2 Activation and Vascular Stabilization in Diabetic Eye Disease*

**Jacqueline A. Taylor**, German Cancer Research Center, Germany  
*Short Talk: Endothelial Notch1 Is a Potent Regulator of Adipose Tissue Metabolism and Function*

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### Mitochondria and Diabetic Complications (J7)

\*Kumar Sharma, USA

\*Assaad Antoine Eid, American University of Beirut, Lebanon

Richard J. Youle, NINDS, National Institutes of Health, USA

General Overview on Mito Maven

Chengxue Helena Qin, Baker IDI Heart and Diabetes Institute, Australia

Role of Endogenous Annexin-A1 in the Cardiovascular Response to Diabetes

Farhad Danesh, MD Anderson Cancer Center, USA

Mitochondrial Reprogramming in Diabetic Nephropathy

Svati H. Shah, Duke University, USA

What Can We Learn from Metabolomics?

### Regulation of Endothelial Cell Differentiation in Development and Tissue Regeneration (J8)

\*Ralf H. Adams, Max Planck Institute for Molecular Biomedicine, Germany

Didier Stainier, Max Planck Institute for Heart and Lung Research, Germany

Vascular Development in Zebrafish

Taija Mäkinen, Uppsala University, Sweden

Mechanisms of Lymphatic Vessel Formation from Progenitors of Different Origins

Hellmut G. Augustin, DKFZ & Heidelberg University, Germany

Epigenetic Regulation of Vascular Maturation

Katsuhiko Kato, Max Planck Institute for Molecular Biomedicine, Germany

Short Talk: Pulmonary Pericytes Regulate Lung Morphogenesis

### Poster Session 2

#### WEDNESDAY, FEBRUARY 28

### Genomics and Epigenomics in Diabetic Complications (J7)

\*Katalin Susztak, University of Pennsylvania, USA

\*Matthias G. von Herrath, Novo Nordisk and La Jolla Institute for Allergy and Immunology, USA

Eske Willerslev, University of Copenhagen, Denmark

DNA Research on Indigenous Populations

Mark I. McCarthy, University of Oxford, UK

Using Human Genetics for Biological Insight and Translational Advantage

Ariela Benigni, Istituto di Ricerche Farmacologiche Mario Negri, Italy

Regeneration of Kidney Vasculature by Angiotensin II Antagonism: New Insights

Assam El-Osta, Monash University, Australia

Epigenetics of Diabetes and its Complications: Beyond Epiphenomenon?

### Molecular Basis of Vascular Diversity (J8)

\*Hellmut G. Augustin, DKFZ & Heidelberg University, Germany

Ralf H. Adams, Max Planck Institute for Molecular Biomedicine, Germany

Organ-Specific and Functional Specialization of Blood Vessels

Costantino Iadecola, Weill Cornell Medicine, USA

The Diversity of the Brain Microcirculation in Health and Disease

Britta Engelhardt, Theodor Kocher Institute/Universität Bern, Switzerland

Specialized Brain Barriers Establish the Immune Privilege of the CNS

Stefan Liebner, Klinikum der Johann Wolfgang Goethe-Universität, Germany

Role of Astrocyte-derived Wnt Growth Factors for Endothelial Blood-brain Barrier Maintenance

Marco Castro, Uppsala University, Sweden

Short Talk: Endothelial Loss of CDC42 Elicits Cerebral Vascular Malformations and Increases MEKK3-Dependent KLF2/4 Expression

Joseph M. Rutkowski, Texas A&M College of Medicine, USA

Short Talk: Enhancing Renal Lymphatic Expansion Prevents Hypertension in Mice

### Workshop: Blood-Brain Barrier Development and Maintenance in Health and Disease (J8)

\*Petra Ulrica Magnusson, Uppsala University, Sweden

\*Dritan Agalliu, Columbia University Medical Center, USA

Ruchi Bajpai, University of Southern California, USA

Cranial Pericytes Derived from Neural Crest Cells Reveal a Pericyte-Specific Functional Defect in Alzheimer's Disease

Ayal Ben-Zvi, Hebrew University of Jerusalem, Israel

Brain Barrier Pathology in Neuropsychiatric Lupus (NPSLE)

Lei Liu Conze, Uppsala University, Sweden

Dynamic Molecular Signatures of Cerebral Blood Vessel during Blood Brain Barrier Development

Selasi Dankwa, Center for Infectious Disease Research, USA

Identifying Host Kinases and Inhibitors that Regulate Barrier Properties in Human Brain Endothelial Cells

Louise Delsing, University of Skövde, Sweden

A Human iPSC-Derived Model to Investigate Blood-Brain Barrier Specification of Endothelial Cells

Evelyn M. Hoover, University of California, Irvine, USA

The Vascular Immune Response to Infection Differs in the Brain and the Periphery



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**Andrei V. Karginov**, University of Illinois at Chicago, USA  
*Barrier-Enhancing Function of Src Kinase in Endothelial Cells*

**Joppe Oldenburg**, Uppsala University, Sweden  
*Identifying Novel Small Molecule Drugs for Cerebral Cavernous Malformation Treatment*

### Mitochondria and Diabetic Complications (J7)

\***Farhad Danesh**, MD Anderson Cancer Center, USA

\***Charles E. Alpers**, University of Washington, USA

**Patrick J. Pagano**, University of Pittsburgh, USA  
*ROS in Vascular Phenotypic Switching and Disease, Target Nox!*

**Karin Agnes Maria Jandeleit-Dahm**, Monash University, Australia  
*The Role of Reactive Oxygen Species in Diabetic Complications*

**Kumar Sharma**, USA  
*Mitochondrial ROS: Friend or Foe?*

**Jay C. Jha**, Monash University, Australia  
*Short Talk: NADPH-Oxidase NOX5 Aggravates Renal Injury in Human Diabetic Nephropathy*

### Oxidative Stress and Diabetic Complications (J8)

\***Costantino Iadecola**, Weill Cornell Medicine, USA

**Christer Betsholtz**, Uppsala University, Sweden  
*A Molecular Atlas of the Blood-Brain Barrier as Revealed by Single Cell RNA Sequencing and Quantitative Proteomics*

**Elisabetta Dejana**, Uppsala University, Sweden  
*Transcriptional Regulation of the Blood-Brain Barrier in Health and Disease*

**Dritan Agalliu**, Columbia University Medical Center, USA  
*Cell Biological Mechanisms of Blood-Brain Barrier Breakdown in Neurological Disease*

**Monica Mangani**, NINDS, National Institutes of Health, USA  
*Short Talk: Peptide-Specific Engagement of Cerebrovascular Endothelial Cells Promotes Dysfunctional Calcium Signaling during Experimental Cerebral Malaria*

### Poster Session 3

#### THURSDAY, MARCH 1

##### Inflammation, the Vasculature and Diabetic Complications (Joint)

\***Anil Karihaloo**, Novo Nordisk A/S, USA

\***Michael Simons**, Yale University, USA

**Andrew J. Murphy**, Baker Heart Research Institute, Australia  
*Hematopoietic Progenitor Cells in Diabetic Complications*

**Mark E. Cooper**, Monash University, Australia  
*An Unrecognized Role for the Adaptive Immune System in Vision-Threatening Neovascular Retinopathies*

**Martin Schwartz**, Yale School of Medicine, USA  
*Endothelial Fluid Shear Stress Responses in Vascular Remodeling and Atherosclerosis*

**Thomas J. Schall**, ChemoCentryx, Inc., USA  
*Targeting CCR2 for the Treatment of Renal Diseases*

**Kyung (Kim) Lee**, Icahn School of Medicine at Mount Sinai, USA  
*Short Talk: Leucine Rich alpha-2-Glycoprotein 1 (LRG1) Is Increased in Diabetic Kidneys and Is a Driver of Angiogenesis and Progression of Diabetic Glomerulopathy*

**Jill Badin**, Indiana University School of Medicine, USA  
*Short Talk: Diabetes Exacerbates Coronary Atherosclerosis and Calcification in Ossabaw Miniature Swine with Metabolic Syndrome*

**Ingrid Fleming**, Goethe University Frankfurt, Germany  
*Short Talk: Inhibition of Soluble Epoxide Hydrolase Prevents Diabetic Retinopathy*

**Reiner Alois Wimmer**, Institute of Molecular Biotechnology Austria, Austria  
*Short Talk: Human Blood Vessel Organoids: A New Model for Diabetic Vasculopathy*

### Vasoactive Hormones in Diabetic Complications/Hemodynamics and Endothelial Pathology (Joint)

\***Susan Quaggin**, Northwestern University, USA

\***Christer Betsholtz**, Uppsala University, Sweden

**Rama Natarajan**, Beckman Research Institute of City of Hope, USA  
*Linking LncRNAs with Diabetic Complications and Angiotensin II Actions*

**Susan Gurley**, Oregon Health and Science University, USA  
*Angiotensin II: Tissue-Selective Effects*

**Merlin Christopher Thomas**, Monash University, Australia  
*Novel Interactions with the Receptor for Advanced Glycation End-products in Mediating Pro-inflammatory Signalling*

**Tatiana V. Petrova**, CHUV, University of Lausanne, Switzerland  
*Endothelial Cell Responses to Biomechanical Forces in Lymphatics*

### Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Joint)

#### FRIDAY, MARCH 2

##### Departure